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EOSDIS Core System Project

ECS Training Material Volume 2A: Introduction and Detailed System Overview: Science Data Processing Internal Training

July 2003

Raytheon Company
Upper Marlboro, Maryland

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ECS Project Training Material
Volume 2A: Introduction and Detailed System Overview: Science Data Processing Internal Training

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Preface

This document is a contract deliverable with an approval code of 3. As such, it does not require formal Government approval. This document is delivered for information only, but is subject to approval as meeting contractual requirements.

Any questions should be addressed to:

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Abstract

This is Volume 2A of a series of lessons containing training material for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS). This lesson provides an introduction and detailed system overview of ECS design and internal interfaces.

***Keywords**:* training, course objective, Earth Science Enterprise, Science Data Processing, Internal Training

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1 through 12	Revised
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Introduction

Identification

Training Material Volume 2A is part of Contract Data Requirements List (CDRL) Item 129, whose requirements are specified in Data Item Description (DID) 625/OP3 and is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

Scope

Training Material Volume 2A provides an introduction and detailed system overview of ECS design and internal interfaces. It summarizes materials presented in a dynamic, animated visual presentation, and includes a copy of the visuals. The instruction briefly addresses the program context of ECS within NASA's Earth Science Enterprise, introduces the systems that make up ECS at a site, describes each subsystem and its Computer Software Configuration Items (CSCIs), including system elements and interfaces, and then describes system functioning in the context of operational scenarios. This lesson is designed to provide the operations staff with sufficient knowledge and information to satisfy all lesson objectives.

Purpose

The purpose of this Student Guide is to provide a summary and copy of the visuals for a detailed course of instruction that forms the basis for understanding ECS overall structure and function. Lesson objectives are developed and will be used to guide the flow of instruction for this lesson. The lesson objectives will serve as the basis for verifying that all lesson topics are contained within this Student Guide and slide presentation material.

Status and Schedule

This lesson module provides detailed information about training for the current baseline of the system. Revisions are submitted as needed.

Organization

This document is organized as follows:

Introduction:	The Introduction presents the document identification, scope, purpose, and organization.
Related Documentation:	Related Documentation identifies parent, applicable and information documents associated with this document.

Student Guide:	The Student Guide summarizes the core elements of this lesson. All Lesson Objectives and associated topics are included.
Slide Presentation:	Slide Presentation is reserved for slides used by the instructor during the presentation of this lesson.

Related Documentation

Parent Document

The parent document is the document from which this ECS Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work

Applicable Documents

The following documents are referenced within this ECS Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

609-CD-610	Release 6B Operations Tools Manual for the ECS Project
611-CD-610	Mission Operation Procedures for the ECS Project
910-TDA-022	Custom Code Configuration Parameters for ECS

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

305-CD-610	Release 6B Segment/Design Specification for the ECS Project
311-CD-620	Release 6B Data Management Subsystem Database Design and Schema Specifications for the ECS Project

311-CD-621	Release 6B INGEST (INS) Database Design and Schema Specifications for the ECS Project
311-CD-623	Release 6B Planning and Data Processing Subsystem Database Design and Schema Specifications for the ECS Project
311-CD-624	Release 6B Science Data Server Database Design and Schema Specifications for the ECS Project
311-CD-625	Release 6B Storage Management and Data Distribution Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-626	Release 6B Subscription Server Database Design and Schema Specifications for the ECS Project
311-CD-627	Release 6B Systems Management Subsystem Database Design and Schema Specifications for the ECS Project
311-CD-628	Release 6B Registry Database Design and Schema Specifications for the ECS Project
311-CD-630	Release 6B PDS Subsystem Database Design and Database Schema Specifications for the ECS Project
311-CD-631	Release 6B NameServer Database Design and Schema Specifications for the ECS Project
313-CD-610	Release 6B ECS Internal Interface Control Document for the ECS Project
334-CD-610	6B Science System Release Plan for the ECS Project
601-CD-001	Maintenance and Operations Management Plan for the ECS Project
603-CD-003	ECS Operational Readiness Plan for Release 2.0
604-CD-001	Operations Concept for the ECS Project: Part 1-- ECS Overview
604-CD-002	Operations Concept for the ECS Project: Part 2B -- ECS Release B
605-CD-002	Release B SDPS/CSMS Operations Scenarios for the ECS Project
607-CD-001	ECS Maintenance and Operations Position Descriptions
152-TP-001	ACRONYMS for the EOSDIS Core System (ECS) Project
152-TP-003	Glossary of Terms for the EOSDIS Core System (ECS) Project
211-TP-007	Transition Plan 6A.04 to 6A.XX (6A.05) for the ECS Project
220-TP-001	Operations Scenarios - ECS Release B.0 Impacts

300-TP-002	Database Descriptions for Synergy III
500-1002	Goddard Space Flight Center, Network and Mission Operations Support (NMOS) Certification Program, 1/90
535-TIP-CPT-001	Goddard Space Flight Center, Mission Operations and Data Systems Directorate (MO&DSD) Technical Information Program Networks Technical Training Facility, Contractor-Provided Training Specification

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Introduction and Detailed System Overview: Science Data Processing Internal Training

Lesson Overview

This lesson provides a brief illustration of the place of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) within NASA's Earth Science Enterprise, introduces the subsystems that make up ECS at a site, examines each subsystem and its computer software configuration items, including system elements and interfaces, and describes system function in the context of operational scenarios.

Lesson Objectives

Overall Objective - The overall objective of this lesson is to become able to describe ECS structure and function for Science Data Processing (SDP). The lesson is a dynamic, animated visual presentation illustrating subsystems, their components and interfaces, and their functions and interrelationships in the context of operations. It is not a complete description of all ECS structure and functioning, and it does not include full descriptions of specific entities in the ECS overall program (e.g., System Monitoring and Coordination Center). It is not a software development lesson and does not include an exhaustive description of ECS interfaces and event sequences. It includes no hands-on exercises, and is not intended as operator training.

Specific Objective 1 - The student will identify ECS subsystems and their computer software configuration items (CSCIs).

Condition - The student will be given a copy of document 305-CD-610 *Release 6B Segment/Design Specification for the ECS Project*.

Standard - The student will list 10 subsystems and specify the CSCIs that make up nine of the 10 subsystems.

Specific Objective 2 - The student will specify for each CSCI the major components and the major functions or processes for which each component is responsible.

Condition - The student will be given a copy of document 305-CD-610 *Release 6B Segment/Design Specification for the ECS Project*.

Standard - The student will correctly identify the major components and their functions for the CSCIs, as listed in document 305-CD-610 *Release 6B Segment/Design Specification for the ECS Project*.

Specific Objective 3 - The student will describe the role of ECS CSCIs and their functions or processes in the context of ECS operational scenarios.

Condition - The student will be given a copy of document 313-CD-610-003 *Release 6B ECS Internal Interface Control Document for the ECS Project*.

Standard - The student will summarize the role of the relevant ECS CSCIs and their components in selected ECS operations, including ASTER Data Acquisition Requests and expedited data support, production and distribution of data products, update of quality assurance metadata, on-demand processing, user registration, and Landsat data insertion and access.

Importance

Knowledge of overall ECS structure and function, and ability to locate and use relevant information in documents 305-CD-610 and 313-CD-610, can provide helpful context for conducting ECS operations and maintenance. This lesson provides the necessary overview, and an efficient summary and guide for reviewing and using the information in the documents.

Summary of the Lesson Presentation

This lesson is composed of a dynamic, animated visual presentation. It is divided into several segments.

Program Overview

The main content of the lesson begins with an overview of the place of ECS in NASA's Earth Science Enterprise, part of the U.S. Global Change Research Program. Slides 4 - 7 address this overview.

Subsystems and Functions

The lesson provides a context diagram illustrating interrelationships among ECS subsystems, and then introduces and examines each subsystem (slides 8 - 12). For each subsystem, the lesson presents major functions, CSCIs and components, and major interfaces among components, CSCIs, and other subsystems. Subsystems addressed include:

- Data Server (DSS): Slides 13 - 21.
- Product Distribution System (PDS): Slides 22 - 33.
- Ingest (INS): Slides 34 - 38.
- Spatial Subscription Server (SSS): Slides 39 – 42.
- Data Pool (DPL): Slides 43 – 48.
- Client (CLS): Slides 49 - 56.
- Data Management (DMS): Slides 57 - 62.
- Order Manager (OMS): Slides 63 – 67.
- Planning (PLS): Slides 68 - 71.
- Data Processing (DPS): Slides 72 - 82.
- System Management Support (MSS): Slides 83 - 93.
- Communications (CSS): Slides 94 - 99.
- Internetworking (ISS): Not addressed in detail in this lesson.

ECS Operational Functioning

ECS operational functioning, introduced in slides 100 and 101, is addressed using selected scenarios. The source material in *Release 6B ECS Internal Interface Control Document for the*

ECS Project, document 313-CD-610, contains additional scenarios, but the ones selected for this lesson illustrate system functioning and the major roles of the subsystems, CSCIs, and components. The animated presentation for this part of the lesson consists of several series of clusters of three visual displays. In each cluster, the first display introduces a step or function at a conceptual level. The second display shows interactions at the subsystem level. The third display shows interactions at the CSCI and component level.

ASTER Data Acquisition Request (DAR) Support

The ASTER DAR support scenario, introduced in slide 102, illustrates ECS functioning for DAR submission, Data Subscription, and attached On-Demand Processing Request. Slides 103 - 115 present this scenario.

ASTER Chaining and On-Demand Production

The chaining and on-demand production scenario illustrates Data Insertion, Data Notification, On-demand Production, Standing Order Delivery, and Quality Assurance Update. Slides 116 - 168 present this scenario.

ASTER Expedited Data

The ASTER expedited data scenario illustrates Data Subscription, Data Insertion, and Data Notification. Slides 169 - 181 present this scenario.

User Registration

The user registration scenario is taken from illustrations of Landsat operations, introduced in Slide 182. Although it is not tied to Landsat, it was presented in that context in document 313-CD-610. Slides 183 - 191 present this scenario.

Landsat Processing System (LPS) Data Insertion

The LPS data insertion scenario illustrates Level 0 (L0R) data insertion, including Polling Ingest of data from the Landsat-7 Archive Management System (LAMS) and archiving of subinterval, scene, and browse data. Slides 192 - 213 present this scenario.

Landsat Data Access

The Landsat data access scenario illustrates search and order of browse data and scene data. It also illustrates data distribution by ftp pull and 8-mm tape, including the role of the PDS. Slides 214 - 247 present this scenario.

Summary and References

The lesson concludes with a brief summary (slide 248) and identification of references (slide 249). As noted previously, the references are documents 305-CD-610 and 313-CD-610.

Slide Presentation

Slide Presentation Description

The following slide presentation represents the slides used by the instructor during the conduct of this lesson.

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